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SOCIETY OF ARTS.

FRIDAY, DECEMBER 17th, 1852.

FOURTH ORDINARY MEETING,

Wednesday, December 15th, 1852.

THE Fourth Ordinary Meeting of the Society was held on Wednesday, the 15th instant. Robert Stephenson, Esq., M.P. F.R.S., Vice-president, in the Chair.

The following were elected Members :

Baxter, Robert Dudley, Highfield, Doncaster.
Francis, E. N., 2, Duke-street, London-bridge.
Garraway, Frederick, Jun., St. John's-wood.
Howard, James H. H., Townsend-house, Dursley.
Roberts, Mrs. Elliot, Twickenham, Surrey.
Starkie, Richard Stringer, 4, Straud.
Wallace, Joseph, Portaferry.
Watson, J. J. W., Gloucester-place, Old Kent-road.
White, Joshua Pugh, Shrewsbury.
Whiting, John, M.D., Lynn.
Whitfield, Henry, Ashford, Kent.
Williams, R., 62, Strand.
Wood, Sir John Page, Bart., Hatherley-house, Gloucestershire.

And the names of nine Candidates for Membership were read.

A Paper was read by Mr. Norton, entitled "Description of an Indicator for Registering Numbers, Distance, and Time." The first application of this invention was for indicating the number of persons passing through any given place where money was received. The Author stated that attempts had been made, but unsuccessfully, to register numbers by means of a step or tread, which alone could not indicate, as it might be acted upon maliciously or accidentally. The improvement consisted in combining the ordinary turnstile, or revolving gate with the tread, in such a manner that the instrument was self-acting, and did not require the person in charge to use his feet on the ingress or egress of each passenger. It was capable of being used in either direction,—and thus might register the numbers passing out of, as well as entering into a building. This was accomplished by means of sliding-rods being brought into contact with the inner surface of a semicircular cone or cap. The distances of the entry and exit-sides of the cone were equal on both sides of the axis through which the rods passed, but varied to such an extent as to drive forward the rod when the stile was turned, and thus set in motion the register or index. It locked itself as each passenger passed through, and would only register one at a time. This turnstile stood within a space of five feet, while those in ordinary use

occupied upwards of seven feet. The arms being jointed, they could be closed up, so as to allow a free passage when required. Mr. Norton here exhibited several models explanatory of the different parts of the machine,—the sliding arm, the tread and bolt, &c. ; and pointed out the peculiarities and modifications necessary for its application to omnibuses, steam-boats, theatres, &c. He also showed another form of this contrivance, by which he was enabled to set in motion a power that centralized in one point, and registered at the same time the ingress or egress from any number of stiles, situated at various distances from each other, and in different parts of a building. This arrangement admitted of instant communication being made to each turnstile, so that all the gates might be locked simultaneously at any required moment.

In the Carriage Registering Machine, motion was communicated from the road-wheel to the instrument by an eccentric fixed on the nave. This set in action a ratchet-wheel, which acted upon a series of multiplying wheels connected with a dial situated in the inside of the carriage. On each revolution of the road-wheel a bolt, which was moved backwards and forwards by a spiral spring, acted upon a ratchet-wheel, driving it forward one tooth. Upon the bolt a guard or stop was fixed, to prevent more than one tooth being moved at each revolution ; and on it entirely depended the accuracy of the indication. Each time the bolt was driven forward, the guard or stop was carried with it, entering a ratchet with the teeth cut in a reverse direction to those acted upon by the road-wheel. Experience had proved that ratchets, when constructed in the ordinary way, on passing over stones where the vibration was very great, were subject to slip, or be driven forward more than one tooth by a single revolution of the road-wheel. This it was which rendered the stop a necessary safeguard ; and without it all instruments were liable to indicate a greater distance than had been actually travelled. The ratchet was the first, or main wheel, in the instrument, and was calculated to make ten revolutions per mile run. This calculation was adjusted to suit all sized road-wheels by simply changing the ratchet. The ratchets were all of one size, and only differed in the number of teeth. The remaining portion of the train was alike for all sized road-wheels.

In another description of the instrument, the principle of the decimal rotation of the ratchet was preserved in connection with a train of wheels and pinions, in continuous action, similar to an ordinary clock train. The ratchet was not driven by the road-

wheel, but by a spring, which, when liberated, drove the ratchet. The object of this was to prevent an excessive strain being communicated to the wheels of the instrument. To these various trains of wheels the "fare" indicator was attached; so that when a person engaged a cab, the fare was indicated according to the distance travelled. The fare-dial returned to zero on the egress of the passenger; and neither passenger nor driver had any control over the indicator. When a passenger entered, a depression of the seat or floor took place, bringing into action the productive mileage-train. It ceased to act when empty, and was restored to zero by means of a lever under the control of the driver. The application of these machines to public carriages, Mr. Norton was of opinion would tend greatly to reduce fraud, and effect an important saving on the part of the public. In the metropolis alone there were 3,500 cabs, and, according to a recent calculation, each cab-driver was in the average daily receipt of from fourteen to seventeen shillings. And as it was well known that, instead of the legal fare of eightpence per mile, one shilling was most usually paid by the passenger, to prevent dispute and annoyance, a saving to the public of fifty per cent., or nearly 200,000*l.* per annum, would result from the introduction of a simple and accurate Registering-Machine.

In the discussion which ensued various points of detail were elicited. It was suggested that road-wheels, of diameters less than those for which an instrument was intended, might be substituted by a fraudulent proprietor; and that thus instead of the register being an advantage to the public, it would be made the means of fraud. To this it was replied, that the proper diameter of the wheel for each indicator might be marked on the face of the dial, and then it would be in the power of any person to test for himself the accuracy of the combination. The question was raised, whether in the event of a passenger leaving a vehicle to make a call, the "fare" indicator would return at once to zero. Mr. Norton, in reply, stated, that by means of a lever, the driver had the power of retaining the seat in its depressed position until he had discharged his fare.

The Chairman announced, that on Wednesday evening, the 22nd instant, there would be a Photographic Soirée, when Mr. Roger Fenton would read a short paper "On the present State and recent Progress of the Art of Photography;" also, that the Fourth Annual Exhibition of Inventions, of such articles as have been patented and registered during the past twelve months, was now open, in the Model-room, on the ground-floor.

EXHIBITION OF INVENTIONS.

THE Fourth Annual Exhibition of this series was opened on Wednesday evening. The collection is arranged under six principal heads: 1. Motive Machines, including Railway Mechanism; 2. Manufacturing Machines and Tools; 3. Building Contrivances and Materials, and Naval and Military Mechanism; 4. Philosophical Instruments and Hardware; 5. Agricultural Improvements and Sadlery; 6. Miscellaneous, including Articles for Personal Use.

It would be difficult in a short notice to give anything approaching to a complete account of the entire collection, to which there has been one hundred and twenty contributors. It is therefore proposed to limit the remarks in this week's Journal to the leading mechanical subjects.

M. Fontaine Moreau exhibits a series of Models illustrative of a means of applying electro-magnetism as a prime mover,—the invention of M. Froment, of Paris. One of these machines is for producing rotatory motion, another vibrating motion; and there is likewise a model of an electro-break contact, or inductor. The difficulties which have hitherto prevented the application of this fluid,—the great decrease of power, due to the recession of the machine to be driven from the poles of the magnet, is proposed to be overcome by making each magnet begin to act when its keeper is nearly close to it. The keepers are brought into position by an eccentric. Mr. Weare exhibits a galvanic apparatus worked by a permanent battery, the power of which is regulated by means of a fixed scale, and is said to increase the longer it is in action. Of the models and drawings of railway mechanism, the drawing of the engine designed by Mr. McConnell, for carrying the express trains between London and Birmingham, a distance of 112 miles, in two hours, is that which will most probably attract the greatest attention. The chief peculiarity of this engine consists in the fire-box being extended into the barrel of the boiler, so as to give direct radiant heat, instead of transmitted heat surface through long tubes. Placed beside this is another drawing, showing the most approved forms of four of our leading locomotive builders; thus enabling a good comparison to be made between them. There are gauges and meters of various descriptions, and for different purposes. The balance water-meter, by Mr. Siemens, which was shown in operation, is said to be capable of working under any amount of variable pressure. The Alcohol-meter is due to some recent discoveries in France, which have determined that the boiling point of alcoholic fluids, such as beer, wine, &c., was regulated by the quantity of alcohol they contained, without reference to their specific gravity. The improvement suggested by Mr. Crockford consists in adding a condenser, of any convenient form, so that the alcohol as it rises is condensed, and thrown back into the boiler. By observing the point at which the mercury rises in the thermometer, the quantity of alcohol is ascertained. The glass gauge tube for locomotive engines

by Messrs. Thornton and Sons, being made larger at the middle than at the ends, is less liable to break from the pressure of steam within.

Messrs. Johnson exhibit drawings of recent improvements in machines for spinning and weaving. The chief of these are Macindoe's self-acting mule, and Messrs. Dickenson and Williams' power loom. There is also a drawing of an envelope folding, gumming, and embossing-machine. Various mechanical contrivances for simplifying and diminishing the labour required in the preparation of articles of daily use, and for domestic purposes, are contributed by Messrs. Lyon, Kent, Crockford, Moreau, &c. Messrs. Shaw and Buck exhibit models of machines for disintegrating, cleansing, and separating the stones, dirt, and other matter mixed with fruits, as they are delivered to the merchant from the producing districts of Zante and Smyrna. Apparatus connected with mining operations, but especially that contrived for the Gold regions, occupies much space. The gold-washing machines all appear to possess a character in common. A galvanized iron wire, or sieve cylinder, in which the earth is placed, is made to rotate. To its axis dashers, or blades, are attached, which in revolving separate the earth, throwing off the lighter particles from the auriferous matter, and retaining the nuggets of gold and stone. The tools required for dislodging the soil from its native bed are endeavoured to be made as comprehensive and simple as their character will admit, by combining a shovel, pickaxe, crowbar, &c., in one tool. Several modifications of the miner's lamps at present in use are shown. It is hoped that by them increased security may be afforded to the workman when engaged in the pit.

The applications of gas and water to heating purposes assume many novel and interesting features. In the hot water stove of Mr. Phillips, water is made to flow round a heated hollow cone. The gas stove of Mr. Goddard is set in a fireplace lined with glazed tiles, by which a large amount of heat is radiated in an unobjectionable manner; and by the use of asbestos in combination with the gas, an approach is made to the incandescent appearance of an ordinary coal fire. The case of the gas stove, by Mr. Blashfield, is made of a new kind of terracotta. The burner is placed below a hollow cone of fire-brick, which serves to give warmth to the apartment, at the same time that it prevents the emission of noxious vapours. In both cases the desire has been to remove the objections to the use of gas stoves, by substituting earthenware in lieu of metal, which, when highly heated, is very deleterious in its effects.

By thus calling attention to some of the leading wants and desiderata of the day, it is believed important improvements may be realized, and permanent benefit conferred on all classes of society. In our next Number we shall endeavour to explain several articles of manufacture, which possess peculiar interest, both on account of their novelty and utility.

SUBJECTS FOR PREMIUMS.

IN accordance with the grouping of the Standing Committees, of which we published a List in our last Number, the second section of the Premium List is devoted to Machinery. It has been said, in certain quarters, that a Society established for the encouragement of Arts, Manufactures, and Commerce, was stepping out of its appointed path in introducing machinery among its objects. The remark is more specious than forcible. There are unquestionably many very useful corporations dealing with special subjects, with whom it is neither desirable nor advisable to enter into competition. But, on the other hand, mechanical inventions have always, and still continue to occupy a large share of the attention of our members, who are drawn from every class, and are not confined to any particular clique, profession, or business. This composite character of the Society forms one of its highest recommendations. The more minutely the sciences and industrial pursuits are divided, the more dependent are they the one upon the other. The study of any branch to the neglect of all the rest is, therefore, not calculated to promote the advancement even of that branch.

A glance, however, at the subjoined List of Subjects will show, that there has been no wish or intention to interfere with the peculiar province of any other Society. On the contrary, it will be seen that they one and all refer, either to the means by which our Commerce may be extended, or the Arts improved, or to the mechanism directly connected with production and manufactures. The latter point especially requires attention; as on it entirely depends the future welfare of our Colonies, and the prosperity of those vast multitudes who have, during the last few years, left their native country. It is well known that we are indebted for many articles of food and clothing to other climes. Those which come from continental states are in most, if not all, cases ready for immediate use. But those from British Possessions still require a vast amount of labour to be expended on them before they are ready for the market. As an illustration of this, it may be sufficient to mention that the vegetable oils of India imported into this country contain the gummy resinous impurities native to their growth. The processes carried on in the Colonies, and the machinery connected with them, are still rude, primitive, and imperfect. This has, doubtless, been caused, in a great degree, by our mechanists not being sufficiently acquainted with the actual conditions of the case; with but an imperfect knowledge of the materials to be operated upon, and the methods that instinct had taught the natives to adopt. Art invariably follows Nature, copying as best it can the appliances she uses; and the more perfect an art becomes, the more simple and natural will be its *modus operandi*. This degree of excellence cannot as yet be expected in the Colonies. For some years to come, machinery will have to be exported from this country. It is therefore essential that it should be so contrived, that the fewest number of parts shall be required to be sent from England, and these as light and as little likely to be broken as possible;

or if broken, capable of being easily repaired by rough workmen. It is well worthy of consideration, whether the abundant resources of Nature in those parts might not be turned to more profitable account. By the introduction of improved processes, it may reasonably be expected that not only would chemical and other substances be extracted from the now refuse materials,—Indigo, for instance, from Flax, at present only grown in India for the linseed,—but the products generally would be so purified, that instead of mere staple, the Colonies might export articles fit for instant application to manufacturing purposes, if not for immediate use. The complete consummation of this idea may be delayed; but the time will come, is perhaps not very far distant, when by the discovery of a new motive power, in which coal and iron shall constitute less important elements, nations not possessed of those valuable minerals may be able to compete with more favoured lands.

It will be observed that the Section concludes with several questions relative to the most recent art,—that of Photography; an art which has sprung into such rapid existence and utility, and is still in so progressive a state, that there is fear lest the links by which these results have been attained should be lost to the world. Though to be an expert in this art requires a certain amount of scientific attainments, it is believed that, like most other arts, its progress is rather due to the practical manipulator than to the experimental theorist. There is ample field also for the philosophical instrument-maker, who is called upon to exercise his ingenuity to aid this art, by designing instruments of greater power and intensity, and capable of assisting in the retention of the colour, as well as the outline and form, of the object represented. At the same time they should be of a lighter, more portable, and economical character. The intended Photographic Exhibition of this Society will, it is believed, demonstrate very fully the present condition of the art, the perfection which it has already attained, and the means by which that perfection has been arrived at.

CLASSES V. TO X.—MACHINERY.

41. For an account of the most recent improvements in Marine Engines, having for their object the reduction of the weight, and the increase of speed.

It is well-known, that a comparison of the ratios subsisting between the horse-power and the weight of machinery in the marine engine, and in the locomotive, is greatly to the disadvantage of the former. And though, from the peculiarities of the case, it may not be possible to arrive at the same degree of excellence, it is felt, by practical engineers, that a closer approximation to it ought to be attained.

42. For the best means of increasing the draught through the Furnaces of Marine Boilers.

The slow combustion in the furnaces has been assigned as one reason why the marine engine would not bear a favourable comparison with the locomotive. An efficient means for promoting this end could not fail to produce a good result.

43. For the adaptation of a new submerged Propelling Power in Marine Navigation, which shall possess all the advantages of the Screw-propeller, and be more immediately acted upon by the moving power.

The opinion now seems to be becoming pretty general, that, sooner or later, the paddle-wheel must give place to the screw, or some other form of submerged propeller. This is particularly the case with war-steamer. The objection to the screw is its distance from the engine. There is, even with the best machinery, much loss of power in transmission through a long shaft.

44. For improvements in Railway Buffers, Draw Links, and means of Coupling, especially applicable to merchandise and other wagons.

Scarcely any of the wagon-stock on railways has, at present, these necessary appendages. It now appears to be considered that all the carrying stock, for whatever purpose designed, should be so supplied, both on the score of economy and safety. To show how this may be accomplished at little cost, would therefore greatly tend to its realization.

45. For an account of the mechanical means at present in use to facilitate the operation of Packing Goods, &c., whether by Hydraulic Presses, or otherwise.

Many materials, cotton and wool, for instance, having to be transported to a distance to be manufactured, it becomes an important element to compress them into the smallest compass, with the least possible expenditure of power, and with the lightest and most portable machine.

46. For a resumé of recent improvements tending to shorten the processes, and facilitate the production of different manufactures:—1st. In reference to Textile Fabrics. 2nd. In reference to Fictile Materials. 3rd. New Mechanical Appliances.

A review of what has been already done in any particular branch of industry, as well as in any science, is one of the best and surest means of drawing the attention of inventive minds to the subject, and leading the way to new achievements. In by far the greater number of cases, inventions are but the further development of old ideas and principles, and anything which serves to keep these before us is certain to be productive of good.

47. For an account of recent American Inventions, having for their object the substitution of mechanical processes for manual labour in the household and domestic arts.

Many of the useful, though apparently unimportant contrivances, in common use in the States, for facilitating, or altogether dispensing with manual labour and attention, might, it is believed, be imported hither with advantage. Even if not applicable to home purposes, they would certainly be of considerable service to emigrants.

48. For the most economic method of Ginning Cotton, so as to obtain the longest and cleanest fibre.

The objections to the use of the saw and roller-gins are, that, in the one case, the fibre is cut by the action of the saw, reducing it to short lengths, and that in the other a portion of the seed is crushed, by which the colour of the fibre is injured.

49. For improvements in Machinery for Printing Calico and other fabrics, by which ten, or more different colours may be worked simultaneously, and with accurate register.

Of late years, cylinder-machines for printing cheap cotton and other fabrics have attracted much attention, to the neglect of the ordinary block-machines, which are known to produce a superior article, in point of softness and artistic effect.

50. For an account of recent improvements in Machinery for breaking, cutting, and dressing Flax.

The cultivation of flax is daily becoming a more important branch of industry; and as the discussion

of the subject has shown that but little has been done for many years to improve the mechanism employed in its preparation for the market, a good essay would be of great value.

51. For an account of improvements in Machinery, and processes for converting spun and other yarn into Rope, Twine, &c.

Though Huddart's machines for the manufacture of rope have been in operation for a considerable period, simplicity of construction is still a desideratum. It is singular that, in many instances, hand-labour is still employed in this purely mechanical manufacture.

52. For an account of the methods now in use for working Malleable Iron; and of any recent improvements in the machinery employed for converting Iron into Bars, Plates, &c.

The vast extension of the iron-trade of late years has led to many important alterations. The large and heavy pieces of machinery now made have not only affected the mechanism connected with their production, but also the manipulation of the material itself. The recent introduction of heavy rails, to supersede the use of stone blocks and sleepers, in the construction of the permanent way of railways, has likewise caused some change to be made in the rolling-mills employed in their manufacture.

53. For the construction of Moulds without seams, or joints for Metal-casting, in the round, or in relief.

The use of elastic moulds in the production of metal-work, by means of electricity, naturally leads to the suggestion, whether any treatment of the same material might enable moulds of this description to be employed in the casting of metals.

54. For the production of Castings in Iron, equal in sharpness and in delicacy of surface to those now imported from Berlin.

It is said, that the great cause of the superiority of Prussian and Swiss fine-art castings is attributable to some peculiarities in the sand used in forming the moulds.

55. For a cheaper mode than any at present practised of working Mouldings and other Architectural features in Granite, or other stones.

The present methods are very destructive to the machinery. With free-working sandstones, the difficulties to be overcome are not so great as with grit-stones; the results obtained are, therefore, more favourable in the former case than in the latter. The powdered stone clogs and destroys the bearings, and eventually stops the machine.

56. For the best, simplest, and most economic Flour-mill, for the use of Emigrants and Settlers.

The extension of civilisation, the subsequent centralization of all manufactures, and the division of labour which this has led to, have induced the construction of powerful machinery applicable to the preparation, on a large scale, of the food of man. But the simple and primitive methods used by our forefathers have been altogether overlooked. The production, therefore, of a simple, portable, efficient, and inexpensive mill, which shall be capable of grinding and dressing the emigrant's meal, placed as he is in a somewhat similar position, is a point worthy the attention of our ablest mechanists.

57. For the best account of the methods at present employed in France and England for Grinding, Dressing, and otherwise preparing Flour.

The superiority of French bread is now universally admitted, and even in this country we find the finest qualities called by that name. There can be no doubt that this is partly due to the method of dressing the flour, and partly to the grain being in a drier state when placed in the mill.

58. For improvements in the Machinery and processes connected with the production of Coffee—for treating the pulpy fruit, and for curing the beans.

Hot air has of late been successfully employed in the preparation of many articles of food; amongst others, to the roasting of coffee. It is now a question, whether some mechanical contrivance for taking advantage of the direct rays of the sun, more effectually than is done at present, may not be introduced. The pulping process is attended with much inconvenience, and it is extremely desirable that some improvement should be made in that direction.

59. For an account of recent improvements in the Machinery and processes employed in the manufacture and preparation of Sugar from the Sugar-cane, and its comparison with Beet-root Sugar.

The enormous loss which has hitherto been sustained, in consequence of imperfections in the processes and mechanism connected therewith, calls for a speedy remedy. In some respects, beet sugar is said to be superior to that made from the cane and the maple; the crystals being larger and firmer, its cohesive force is consequently greater.

60. For the best account of recent improvements in the Construction and laying-out of large Breweries, and the "Plant" connected therewith.

The large breweries of the metropolis and elsewhere, having grown up by slow degrees, have been added to "piecemeal," so that there is a want of consistency and uniformity which would not be admissible in a modern establishment. The "plant" is generally cumbersome and inconvenient, and stands in much need of modification.

61. For a simple and inexpensive Apparatus for Brewing Beer, suitable for the use of cottagers or emigrants.

Brewing has always been looked upon as one of the Domestic Arts; but it, like many others, has been influenced by the centralization system. The object required is to extract the saccharine matter, and convert it into an article fit for the table, by one simple process.

62. For the best Essay on the means by which the Roofs and Walls of large Buildings may be constructed so as to avoid interference, by Echoes, or Sounds, with the utterance of a voice, and to render such audible to the largest number of persons; with especial reference to the building of Lecture and Meeting-rooms.

The principles of Acoustics, at all events in their practical applications, do not appear to be well understood. Too little attention has hitherto been paid to this subject by architects and builders, and the consequence is a most lamentable deficiency, in this respect, in many modern edifices.

63. For the best Essay on the Construction of Fire-proof Buildings.

Though it is a disputed point whether our ordinary dwelling-houses can be made absolutely fire-proof, there can be no question that the nearer we approach perfect immunity from danger from fire the better. There seems to be no reason, however, why all buildings, other than dwellings, should not be rendered perfectly secure, as in some few instances they are at present.

64. For the best Essay on the Construction of common Roads.

This branch of Engineering has, of late years, been comparatively neglected for the more attractive railways. Roads can scarcely be said to have been improved since the time of Telford. The Holyhead road is still a masterpiece. Now that the condition of our towns is being looked into, we may expect some reformation, particularly in the matter of paving.

65. For an account, accompanied by a series of drawings, of the Construction of Saloon-steamers on American Rivers; and the adaptation of the principle to European River and Ocean Navigation.

These "floating hotels," as they are termed, are a subject of universal comment by travellers. They appear to present many points worthy of imitation, and, with our variable climate, to be well suited to meet the exigencies of an increasing river-traffic. The cheapness of glass affords an opportunity for constructing the sides almost entirely of that material. Whether the principle can be successfully carried out for ocean navigation remains, however, to be proved.

66. For the most economic means of obtaining and maintaining a Vacuum; and the purposes to which it may be applied.

Though in its strict and absolute sense the attainment of a perfect vacuum is impossible, yet it is well known that we have practically realised this desideratum to a very great extent. There is scarcely a single piece of machinery which does not owe its efficiency, in some degree, to this property. The steam-engine itself may be cited as, perhaps, the most important. More recently, the principle has been applied to many manufacturing processes—the manufacture of sugar, for instance; and, as it would appear, with considerable advantage.

67. For an Essay on the Scientific Principles evolved in the application of the Stereoscope.

As no complete and popular treatise has yet been published on this subject, which is one of growing and daily-increasing interest, a good essay would be very valuable.

68. For improvements in the Oxy-hydrogen Microscope, and the method of illuminating it, by which a bright object may be presented on a dark ground.

The objection to the oxy-hydrogen microscope is, that it presents a dark object on a bright ground, causing great injury to the sight of persons using it. An efficient means of inverting the order, and producing a bright object on a dark ground, is, therefore, a desideratum.

69. For a cheap, convenient, and portable Camera, with stand and materials complete, for taking Calotype views.

A light, portable tent, to serve as a dark chamber, is much required as an appendage to the ordinary camera. Improvements in the camera should tend to compactness, simplicity of construction, and perfection in use.

70. For the most sensitive portable means of taking negatives for Calotypes.

The preparation of the collodion plates should be such as to enable them to retain their sensitive properties for a longer period than at present, so as to render the bath unnecessary in out-door operations.

71. For the best means of bringing an object within range of a Camera, when beyond its focus.

It is thought that this might be accomplished by placing a more or less transparent medium between the lens and the box of the camera, or by the introduction of an additional glass.

72. For an Essay on recent discoveries in the production of Photographic and Talbotype Images, especially in the taking of material objects by means of the Microscope; with Illustrations.

The camera, in combination with the microscope, has now been brought to bear directly upon this most interesting art.

73. For a good and cheap method of making Glass Balance-springs, suitable for Marine Chronometers.

Glass springs have many advantages over those made of metal. They require little or no compensation, and are not liable to rust, a point of great importance at sea.

AGRICULTURAL IMPLEMENTS AT THE SMITHFIELD CLUB CATTLE-SHOW.

THOUGH this department forms but an adjunct to the great annual metropolitan gathering, and though at the numerous meetings of a like character held throughout the year in different counties, implements are exhibited, there is still occasionally to be found at the Bazaar in Baker-street some new principle, or novel application of one previously known. It must be confessed, however, that by far the greater number of articles are tried and old friends, proud of displaying all the honours and rewards received from various Agricultural Societies and Associations.

The most important collection, both in value and in extent, in the present Exhibition, is unquestionably that contributed by the Messrs. Garrett. Taking advantage of the inventions of our Brothers across the water, they have registered some improvements in Hussey's American Reaping-machine, which bid fair to make that hitherto useful machine still more complete. In the machines brought over from America, the cutters were bevelled on both sides, similar to a common axe, which was found, in cutting soft straw crops, such as barley and oats, to have the effect of bending the straw between the iron guards in which the cutters work, and pulling it instead of cutting it. The improved form of cutter is bevelled on one side only, similar to a pair of shears, or scissors; and, cutting against a keen square-edge guard, made of steel, this defect has been completely remedied, and crops of any kind may now be perfectly cut with equal precision and facility. Two horses, one man, and a lad, will cut about an acre per hour. Messrs. Garrett also exhibit a broadcast manure-distributor, the invention of W. Blyth, Esq., of Burnham, the novelty of which consists in the arrangements for effecting the delivery of difficult manures used as top-dressing, such as nitrate of soda, guano, &c. A shaft, fitted with prongs, revolves in the barrel containing the manure, and in doing so comes in contact with a series of scrapers which rise with and clean the barrel as it rotates, without the aid of brushes or any other perishable material. The manure then passes down a shoot, or conductor, in which alternate lines of wire rods are fixed, serving still further to separate and pulverise the material.

A very useful and compact hand-mill, for grinding flour and dressing it at the same time, is exhibited by Messrs. Lloyd and Sons. The meal, after being ground, passes into a cylinder fixed at a certain inclination. The under-part of the cylinder is perforated, to admit of the passage of the meal into the different drawers placed beneath it. In the cylinder there are revolving brushes, which keep the meal in motion, and by these means the heavier particles descend gradually to the lower end, the lighter—that is, the fine flour—falling at once into the drawer. This machine is capable of sorting the meal to an inconceivable extent—fine flour, firsts and seconds, pollard, and bran, all being completely separated into distinct drawers.

The great advantage of glass vessels over those made of earthenware, for dairy use, is now universally admitted. In this department, Messrs. Cogan show several very ingenious applications. Among these, a churn, the barrel of which is made of strong glass, and a glass pail, may be especially noticed. In both cases, the total absence of metal will be recognised as an important feature. It should be stated that the glass pails have portable bottoms and handles; the former of basket-work, the latter of gutta percha.

In the double-acting churn and sausage-meat chopping-machine, exhibited by Messrs. Dray, vertical and rotatory

motion are ingeniously combined. But what will be looked upon with the greatest interest in their collection is a grindstone, in which, instead of the usual bearings, each end of the axis is supported by two small anti-friction rollers, so that the force required to set the stone in motion is exceedingly small: and, when once in motion, very little power is sufficient to sustain it.

In conclusion, it is to be regretted that no systematic classification of the articles exhibited is adopted; and this is rendered all the more perplexing by the want of a Catalogue. The opportunities which agricultural implement-makers have had, more than any other class, to compare together the results of their individual experience, and of which they have not failed to avail themselves, have certainly done much for this kind of machinery. It is believed, however, that a great deal yet remains to be accomplished. Many of the machines appear unnecessarily complex in their arrangements, have a far greater number of parts than is necessary, and these again are of heavier calibre than the actual conditions seem to require.

COLONIAL CORRESPONDENCE.

THE WEST INDIAN LABOUR-MARKET.

THE following valuable remarks on the state of labour in the West Indies, and the emigration of Chinese labourers to those colonies, are extracted from a communication lately made to the Colonial Committee by Mr. W. P. Hammond, of the firm of Parker Hammond, and Co.

"It has been truly remarked by Sir Archibald Alison, in his recent continuation of the 'History of Great Britain,' that the present period will take its place in the records of the world as 'the age of migration.' The sources of this migration are as remarkable, and as eminently adapted to carry out the designs of Providence as the causes of the movement. Whilst the latter may perhaps be mainly attributed to the discovery of gold, and to over population, the former may be considered to centre in Great Britain and in China.

"These two nations, so distant and so different from each other, appear destined specially to be the instruments in carrying out to completion the command—'Increase and multiply, and replenish the earth and subdue it;' and in considering the singularly opposite characteristics of the two races, I think it will be found that this very diversity will prove no unessential element in carrying out this great result. The former country,—the very type of progress and energy,—the workshop of the world,—the steward of so many possessions, and as she is insular in position, so also is she almost equally isolated in 'daring to be free,'—such a people are essentially adapted both by education and intellectual development, to take the lead in new commonwealths, and to give the initiative to unborn empires. The latter country,—the very impersonation of finality,—the voluntary captives of an exclusive despotism, the jealous possessors of a mighty country, rejoicing in the epithet of the 'Great Unknown,' wrapt in the complacent self-conceit of its by no means contemptible, but wholly unprogressive civilization, though the veil which thus enshrouds one-third of the human race is, I trust, rapidly rising. Such a people have received, in the school of ages, the

lessons which especially suit them to the plodding and relatively unintellectual position of the subordinate and the labourer.

The Chancellor of the Exchequer, in his elaborate statement of Friday last, touched upon two points having reference to this remarkable people,—the reduction of the tea duties, and the value of China as a labour-market. The former cannot fail to stimulate a wholesome and mutually profitable intercourse between the two countries, as yet so little known to each other, and will also, I trust, be the commencement of a policy, having for its object the removal of the distrust and jealous isolation which has hitherto animated the government of China in its relations with this country. With the latter (that is Chinese labour), as more applying to the subject before me, I have more to do.

"It is not the least remarkable social phenomenon of our times, that whilst the West Indian Colonies urge with great justice, the injury which their interests suffer from want of labour, one of the largest and most agricultural provinces of China should possess thousands,—I might almost say millions,—of able-bodied and industrious labourers in a state of semi-starvation from the want of remunerative employment. Now in reference to the West Indies, Mr. Disraeli says, 'Certainly nothing could be more legitimate than the immigration of labourers into our colonies, and it is one which undoubtedly ought to be encouraged. My attention, as was the attention of the late Government, has been drawn to the subject of the immigration of Chinese labourers, and it certainly is a most important subject for consideration.'

"The Chancellor further stated, that this emigration was opposed to the laws of China; but he added, in effect, that this difficulty appeared to have been readily got over, which was naturally to be expected, when the same description of emigration has taken place to the Eastern Archipelago and to Singapore, as well as to other places, for many years without any apparent objection on the part of the Chinese Government. He further mentioned, that several vessels had already been despatched 'under Government control,' to the West Indies with emigrants.

"The three primary demands of the West India planter appear to have been,—the retention of protection in his staple product, sugar,—an augmentation of the sums at the disposal of the Colonies for the purposes of emigration,—and an increased supply of labour. As the Government state decidedly, that, in their opinion, the planter is already able to command the home-market, without that protection which perhaps it had been better for him that he had never received, and that the artificial aid of loans did not appear to be practically useful, even to the extent of the present grants, it especially behoves the West India interest to look to the third point, viz., a supply of labour.

"The port of Singapore, established as you will be aware in the early part of the present century, by Sir Stamford Raffles, upon the principles of perfect freedom of trade, and with the most perfect success, has obtained its supply of Chinese labourers for many years *exclusively* by the agency of private enterprise, the penniless

Chinese being brought down in Chinese vessels, and the price of the passage being paid by their employer on arrival, in exchange for an agreement to receive only partial remuneration, for a certain period, such period being regulated solely by the natural influence of supply and demand. This plan has been, therefore, in active operation, in a British island, for a series of years, without the slightest approach to, or fear of slavery, or anything analogous to it.

"Now the Chancellor in his statement as regards the West Indies, proves two things,—that the consumption of Colonial sugar has greatly increased under freedom of trade, whilst the artificial effort to stimulate emigration by Government loans or bounties, has at all events only partially succeeded. Let us hope, therefore, that as the West Indies are in future to rely solely on their own energy and resources, that the Government will at least accede to their request to be allowed to manage for themselves also in the matter of emigration.

"But at present, the law in many of the West India Islands enacts, that any contract made with labourers for a longer period than one year is illegal. This policy is best symbolized by the Cup of Tantalus,—the planter is allowed to introduce the labourer, but just at the period when his labour is likely to become valuable, and the necessary initiation into the details of his duties is completed, his employer is made to forfeit, 'by Act of Parliament,' all chance of obtaining a return in usefulness for his outlay in conveyance, and trouble in instruction, by the compulsory termination of his agreement. I am assured by parties thoroughly conversant with the position of the West Indies, that were permission granted for the introduction of Chinese emigrants, under contract for three or five years, that they see no difficulty in arrangements being made with planters for their introduction.

"Under these circumstances, it would surely be better that Government should leave it to the planter to supply himself with labour by means of private enterprise, rather than through Government agency, which is always expensive, and frequently unsatisfactory, and has the additional objection that it acts as a serious check to any private arrangements, by raising a Government competition against individual exertion. I am strongly of opinion, that the legitimate interposition of Government should be confined to ensuring at the port of shipment, such conditions as the following:—A proper vessel with suitable and convenient accommodation, due regard being had to the habits of the emigrants; a medical certificate of health and good constitution of each emigrant on going on board; a competent surgeon, and good and abundant food. On arrival in the West Indies, the labourer should have a prompt and gratuitous means of obtaining redress, if not in every way properly treated by his employer.

"I am informed, however, that amongst other conditions required by the local authorities, it is necessary that each employer should have substantial cottages ready built before he is permitted to land the emigrants. This, under all the circumstances of the case, raises a most serious impediment, and, coupled with the restriction to a twelve months' contract, constitute by far the

most important, if not the only, hindrance as to the satisfactory and voluntary introduction, on the part of private owners of estates in the West Indies, of one of the most docile, thrifty, and strong-constituted race of labourers on the face of the globe,—denizens also of a latitude the same as that of Cuba.

"Feeling that this is a question especially interesting at the present moment to our West India Colonies, and being one with which I have for some time past made it my business to become acquainted, as a practical and commercial operation, I have taken the liberty of troubling you with this unintentionally long communication, knowing that our Colonial Committee are desirous of availing themselves of any information or remarks likely to advance the interests of those important dependencies."

HOME CORRESPONDENCE.

LECTURES.

SIR,—I read with much pleasure an article in your last Number, under the head of Lectures, and signed "Y. Z.," in which the writer proposes to raise the character, and increase the utility of Mechanics', and similar Institutions, by giving them more the form of People's Colleges. I have long felt convinced that the present system adopted by Mechanics' Institutions in general, is not one which is likely to raise a class of philosophers, whose services will be of much benefit to themselves, or to Society at large.

The argument that has hitherto been commonly used in favour of such Institutions, is that of their keeping people from the public-houses, and hence a large proportion of them are little more than simply places of amusement. Could not, therefore, some plan be adopted by which, in addition to their present advantages, Mechanics' Institutions might be able to offer a more complete system of instruction than they at present do, by Courses of Lectures, Laboratory instruction, Schools of Design, &c.; and that examiners should be appointed, to hold examinations and confer certificates of different orders of merit? It may be said, in answer to this, that such additions would require an outlay which but few Institutions could afford. It is true that additional expenses would certainly be incurred, but I believe by combination these would be greatly reduced; and that when once the country saw and felt the great advantages likely to accrue from such a system, Government would be more willing to make grants and furnish loans for carrying out so important an object.

When we consider how many of the most intelligent of our countrymen of the present day have risen from very inferior stations in life to the important and useful position they now hold in society, it becomes of the utmost importance for the prosperity of a great commercial country like this, that every opportunity should be afforded to those whose mental capacities are only waiting a stimulus, or waiting an opportunity, to bring them into activity.

A. B., Treasurer of an Institution.

PHOTOGRAPHY.

SIR,—I am glad to see the Society, by its Prize List, calling attention to the manufacture of Cameras and other matters connected with Photography. No mention, how-

ever, is made of a desideratum; namely, good porcelain dishes, or a cheap substitute for them, which will stand the action of the gallo-nitrate mixtures. The glazing of almost all is very defective in having flaws, or cracks, into which these mixtures penetrate, defying all cleaning, even with nitric acid. The consequence is that each of these flaws becomes a centre of decomposition, spreading over the whole quantity of the mixture, producing a marbling of the proof, and destroying the negative. As however the Society does not confine its Prizes to the objects named in its List, I wish that manufacturers would turn their attention to this want, and send specimens to the Society for its judgment.

By-the-by, I hope the cameras sent will be good *working* instruments, not enhanced in price by too much French polish and ornament, with which makers are too apt to favour our poor photographers. F.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

INSTITUTE OF ACTUARIES.—The first ordinary Meeting of the Session, 1852, 53, was held on Monday, the 29th of November, John Finlaison, Esq., President, in the chair. The President opened the meeting with a review of the progress of the Institute, now entering on its fifth Session. The Secretary announced numerous valuable donations to the library, including several from foreign corresponding members. Lord Overstone was elected an honorary member of the Institute.

Three papers occupied the attention of the meeting. The first was "On Formulæ for obtaining the Value of Policies at an Intermediate Period of the Year," by James Meikle, Esq. The author considered that the method frequently adopted in the valuation of policies at an investigation involved an incorrect assumption, which deviated further from the truth the longer the policy was in existence. The value of a policy at the beginning or the end of the year is found by a direct calculation; but in order to bring out the value at an intermediate period of the year, it was the practice to add to the value of the policy, calculated at the date of next premium becoming due, a proportion of the annual premium corresponding to the unexpired portion of the year. The author considered this addition to be excessive, and deduced formulæ to suit the various systems adopted by actuaries, from which Tables could be compiled for an average intermediate month by a direct calculation, without the necessity of first finding the values at the beginning and end of the year, and interpolating for the particular month.

The second paper was "On the Life-Assurance Companies of Germany, their Constitution, Condition, and Prospects," by Herr Rath G. Hopf, of Gotha. The author compared the systems of the French and German Companies, and showed that the latter have been constituted more on English models than the former. An effort was made to establish a Life-assurance Company in Germany as early as 1806; but the unsettled state of the country rendered this and other attempts abortive, nor was it till 1829 that the first Company was formed. This was established in Gotha, and now comprises upwards

of 16,855 members, upon whose lives 3,800,000*l.* sterling is assured. In twelve Companies (all established since 1829), the total amount of sums assured on lives is stated to be upwards of 7,400,000*l.*; and the number of policies 1,836,455. The paper concluded with a short account of the system of each Company.

The third paper was "On the Insurance-Companies of Austria," by Herr S. A. Daninos, of Trieste. The author gave an account, on a somewhat similar plan, of the Assurance Companies in the Austrian empire; but included also those for fire, marine, and other branches of assurance. It appears that, in the proprietary and Mutual Fire-Insurance Companies, 172,000,000*l.* sterling was insured in 1850; and that in Trieste, and other places on the Adriatic, there were no less than thirty Companies for maritime assurance, of which twenty-six possessed a joint capital of half a million sterling.

It is little known in England to what extent the principle of the assurance of life and property has been carried on the Continent; and it is gratifying to think that these communications on the subject should have been one of the results of the Great Exhibition. The Institute of Actuaries took advantage of that occasion to form a gathering in London of the representatives of the different systems of assurance in all parts of Europe and America, and subsequently elected the leading actuaries of each continent corresponding members of the Institute.

PROCEEDINGS OF INSTITUTIONS.

ASHBOURN.—On the 6th inst., Mr. J. Bamford delivered a Lecture to the members of the Literary Institute, entitled, "An Hour with Goldsmith." The Lecturer opened his address by some general remarks on the varieties of poetry, and the elements which are essential to give it a continuing popularity; and then went on to discuss the peculiarities of Goldsmith, which had given to his writings the undying popularity they possessed.

CARLISLE.—On Tuesday, the 7th inst., the Rev. Richard Hunter delivered a Lecture to the members of the Mechanics' Institute, on "Speech, as indicative of Man's Pre-eminence over the Brute Tribes." Mr. Hunter opened his discourse by a few general and appropriate remarks to show that the faculty of speech, which he defined to be the articulate and audible expression of ideas and emotions, was that which distinguished man from the inferior animals. He then traced the distinction between reason and instinct, and contended that the sounds made by any given class of inferior animals had been from generation to generation the same, and were similar in every clime; whereas with man the fact was widely different.

DARLINGTON.—On Tuesday evening, a Lecture (the first of a series of three) was delivered at the Mechanics' Institution, by E. Ward Jackson, Esq., of Norton, "On the Moral, Social, and Physical Condition of the People of this country during the past Fifty years." The lecture contained a vast amount of statistical information

of much importance, gathered from Parliamentary papers of undoubted authority, tending to show that great efforts have been made to improve the condition and increase the comforts of all classes, but especially of the industrial part of the population.

GATESHEAD.—The first *Soirée* of the members of the Reading-room was held on the 30th ult., at the Public-rooms, when about 400 assembled. Mr. A. G. Gray took the chair. The meeting was addressed by Mr. Joseph Cowen, jun., of Blaydonburn, and Mr. T. P. Barkas, of Newcastle.

HUDDERSFIELD.—The Second Fortnightly Meeting at the Mechanics' Institution was held on Saturday evening, when Mr. James Hanson delivered a Lecture explanatory of the Pestalozzian system of teaching, with illustrations. Dr. Cameron, Mr. Brice, of the Huddersfield College, Mr. Senior, Mr. Hanson, and others, took part in a discussion on the subject after the lecture.

LONDON.—On Monday evening a *Soirée* and *Conversazione*, in celebration of the Twenty-ninth Anniversary of the Mechanics' Institution, was held in the theatre of the Institution, Chancery-lane. Lord Dudley Stuart, M.P., Mr. Oliveira, M.P., and other influential gentlemen, were present. Lord Dudley Stuart, in addressing the meeting, spoke briefly, but forcibly, in favour of Mechanics' Institutions, and the benefits which had already accrued from their establishment. The plan was yet in its infancy; but he did not doubt that when the sphere of their operations became more extended, and better appreciated, still more gratifying results might be looked for. His Lordship, after passing a high eulogium upon the character of the late Dr. Birkbeck (the original Founder of these Institutions), regretted that the Government had not thought proper to award more than a pension of 50*l.* per annum to Dr. Birkbeck's widow,—though it was partly accounted for by the Secretary of State being limited to an annual expenditure of 1,200*l.* in pensions upon the Civil List. Such a scanty sum as 1,200*l.* per annum was totally insufficient to meet the many just claims upon it which were brought to the notice of the Government in the course of the year; and though he (Lord Dudley Stuart) had always been averse to any lavish expenditure of the national income, he would gladly give his support to any measure which might be brought forward to increase the sum so placed at the Secretary of State's disposal. After the address, the meeting was entertained by musical and dramatic performances, by the members of the musical and elocution classes connected with the Institution.

LYMINGTON.—On Tuesday evening, Mr. D. Macintosh delivered a second Lecture on "Geology," at the Literary Institution. He spoke of the periods when the earth was inhabited by races of animals which have long passed away—the formidable Ichthyosaurus, the tremendous Dinotherium, the primeval Elephant, the colossal and sullen Megatherium, the singular-looking Plesiosaurus, an inhabitant of this part of the island, the winged and bat-like Pterodactyle, or Flying Lizard, &c.; all which had evidently been adapted for the full enjoyment of animal life. The lecturer alluded to the stratified rocks, as including a multitude of

distinct deposits, most of which inclosed organic remains, derived from successive races of animals and vegetables, comparatively few of which, except in the upper formations, seem to have any living congeners.

MODBURY.—On Friday, the 10th inst., a Lecture was delivered at the Institution by the Rev. John Pyer, of Devonport, on "Modern Popular Literature." The lecturer took a brief but comprehensive glance of the rise and progress of literature previous to the printing of the first book in the English language, by William Caxton, down to our own times; dwelling more particularly on the popular literature of the present age. The lecturer concluded by giving the youthful members some useful hints on profitable reading.

NEWPORT, ISLE OF WIGHT.—On Thursday evening, the Rev. E. Kell delivered a very excellent Lecture, on "The Roman Antiquities to be found in the Isle of Wight," to the members of the Athenæum. The lecture was illustrated by a vast and rare collection of Roman coins, in copper, silver, and gold, found in the island, as well as urns, bracelets, weapons of war, &c.; most of which are to be placed in the Isle of Wight Museum.

PUDSEY.—A Special General Meeting of the members of the Mechanics' Institute was held on Wednesday evening, for the purpose of amending the rules and regulations. This Institute now numbers upwards of 150 members, of whom 80 are females. All the classes are in full operation. Four nights in the week are devoted to the use of the male members, and two nights for the female members. In the classes are taught reading, writing, arithmetic, English grammar, and geography; and Mr. Lamb, Professor of Logic and Languages, has opened a logical class, which is well attended. There is a good library, consisting of upwards of 400 well-selected volumes, on science, history, and biography. The library is open two nights a week; and it is the intention of the Committee to open a news-room in connection with the evening reading-room.

SOUTHAMPTON.—A highly interesting Lecture was delivered to the members of the Polytechnic Institution, on Wednesday evening, by Dr. J. Marshall, on "The Natural History of Man." The various opinions respecting the first creation and propagation of organised matter in general were considered. The characteristic distinctions of man were then pointed out, the lecturer dwelling particularly on the adaptation of his structure to the erect attitude, and on those noble (and almost Divine) attributes—Reason and Speech. Lastly, he spoke of the varieties of the human race; and after accounting for them on scientific principles, concluded a most able and instructive lecture by narrating several amusing anecdotes relative to the customs of the various inhabitants of different countries.

ST. LEONARDS-ON-SEA.—The Lecture Session of the Mechanics' Institution opened on Wednesday evening, Dec. 1st, with a very interesting Lecture on "Wonders of Vision," illustrated by a number of elaborate diagrams, by Mr. W. R. Selway, of London.

SUDBURY.—At the Literary Institution, on the 30th ult., the Rev. E. Bull, M.A., delivered a

very interesting Lecture on the "Progress of the Nation;" and on the 10th inst. the Rev. W. C. Roberts, M.A., gave a Lecture on "Italy and the Italians." Both lectures were well attended, and appeared to give great satisfaction. A drawing-class has recently been formed in connection with this Institution, which is progressing favourably.

THAME.—Mr. Miles has recently delivered two Lectures to the members of the Mutual Improvement Society, on "The History and Mechanism of Clocks and Watches." The lecturer exhibited clocks of different kinds, and explained their construction, and relative merits and defects. By this simple means, without the need of previous preparation, an interest was secured in the subject. This successful experiment, coupled with the difficulty of providing funds for the payment of lecturers, and the equal difficulty of men engaged in business giving much time to the preparation of gratuitous lectures, suggests the inquiry, Whether practical men, connected with different branches of the arts, might not frequently interest and instruct the members of Institutions in their special departments without much trouble to themselves?

YORK.—The Rev. E. Higginson, of Wakefield, recently delivered a Lecture at the Mechanics' Institute, entitled, "A Few Hints on the Art of Good Reading." He stated that reading should resemble, and ought not to be distinguishable from, good speaking or conversation, and that children should not be compelled to read or spell "great swelling words," but should be confined to that language which was natural and suitable to their infantile capacities. Good reading was essential in order to form an adequate conception, and to grasp the idea of the writer, which would otherwise be imperfect and unnatural.

NOTICES TO CORRESPONDENTS.

Country Institutions.—Correspondents who are so good as to send reports of proceedings, are requested to forward them not later than Tuesday morning, or they will be too late for insertion in the following Friday's Journal.

Subscribers to Journal.—We cannot undertake to forward the Journal to unknown correspondents. In reply to a number of communications, we must state that it can be obtained through the usual trade channels.

Members.—Several Members of the Society have complained of not receiving the Journal. In every case, however, it has been found that they were duly delivered, and that the blame really rested with the Members' servants.

Petitions.—In answer to numerous inquiries as to the best time for presenting petitions to Parliament respecting the distribution of Parliamentary Reports, we have to state that any time during the next two months will do.

Anonymous letters cannot be attended to. All communications, whether the author's name is to appear or not, must be accompanied by the writer's name and address.

QUESTIONS FROM CORRESPONDENTS.

Calf Leathers.—Can you inform me where I can obtain a comparative statement of the cost and methods of treating calf-leathers in Europe and America? (No. 13.)

Morocco.—Is there any account published, which points out the relative qualities of French and English morocco, both as to softness, flexibility, perfection of colour, and durability in use? (No. 14.)

Cements for Roads.—Is there any cheap and efficient cement, which can be used for binding together the broken metal in Macadamized roads? (No. 15.)

Marbling Slate.—What is the nature of the process for marbling slate? (No. 16.)

Drying Corn.—Can you tell me where I can obtain a drawing and description of the most approved form of kiln for drying corn? (No. 17.)

ANSWERS TO CORRESPONDENTS.

"J. C. T., Thame," and **"G. B., Bristol."**—Thanks for the printed copies of your Rules and Orders, sent in accordance with the letter of "P. S.," at page 32.

"G. B. C., Woburn."—The parcels of books, &c., presented to Institutions, are sent out in the order of their joining the Union. You will receive yours in a few days.

"J. R., Whitehaven."—The List of Institutions in Union was printed in the first Number of the Journal.

"P. M., Brighton."—The Papers to be read at the next Meetings of the Society of Arts are always announced in the Journal.

"J. H. B., Blandford," **"E. W. G., Newbury,"** **"F. P., Bakewell,"** **"T. H. A., Buntingford."**—Certainly; forward your petitions to Parliament, they will be in very good time.

"W. S., Morley."—To admit indiscriminately the Members of any Society to the meetings of the Council or Committee would never do; it is contrary to all experience in such matters.

MISCELLANEA.

GUTTA PERCHA.—M. Perrot, at a late meeting of the Paris Academy of Sciences, submitted some specimens of Gutta Percha, which he had purified to such an extent, and manufactured in such thin sheets as enabled him to use it as a substitute for paper, upon which he had taken impressions from the lithographic stone. One of the advantages which he stated this would possess over the ordinary paper impression was, that of enabling the reverse of any given object to be obtained, without the labour of redrawing it.

MANUFACTURE OF SUGAR.—Mr. Bessemer's patent improvements in sugar manufacture promise to be of great value in the Colonies. It is stated, that by his new press the yield of juice is increased 50 per cent. over that produced in the ordinary cane-mills. He also proposes to do away with the vacuum pan, substituting in its place a very ingenious contrivance, in which an extended surface, kept constantly wetted with the juice, is exposed to a rapid current of warm dry air, urged by a common blowing-fan. By this means the juice is rapidly evaporated at a comparatively low temperature, and whilst the cost of the operation is lessened, the loss from the formation of molasses is likewise diminished. A third improvement consists in a new mode of washing and draining the sugar. A web of wire gauze is kept in motion, and the principle of atmospheric pressure is employed to render the drainage of the crystals rapid and perfect.

IRON IN INDIA.—There are extensive beds of rich iron ore and limestone in Kemaon, and abundance of timber for fuel. At present, however, these natural advantages appear to be wholly neglected. The ore contains about sixty per cent. of metal, but the native workmen are satisfied with a yield of nine per cent.; and the trees are cut down and left to rot on the ground, whilst only the smaller branches are converted into charcoal! The iron which is made, however, is of excellent quality.

SALT IN IRELAND.—A Company is about being formed in Belfast, with a capital of 50,000*l.*, to work the Salt-mines which have been discovered on the Marquis of Downshire's estate at Duncane. In connection with the preparation of the salt for commerce, chemical works are to be established, which will enable the Company not only to supply manufacturers with bleaching-materials, but to export them in large quantities to other countries. —*Mechanics' Magazine.*

THE NEW CRYSTAL PALACE.—The Directors, amongst their many arrangements, have determined to appropriate a portion of the Building under the name of a "Court of Inventions," where Inventors, Patentees, and others, may exhibit their Inventions. The New Patent Law, by the principle of provisional protection from the date of application, gives Inventors great facilities for exhibiting and displaying their Inventions, and taking advantage of this arrangement.

NEW GREEN DYE.—M. Persoz has recently examined a new green dye received from China; it is perfectly distinct from Indigo, though resembling it, and is evidently of vegetable origin; the colours dyed with it are brilliant, and remarkably permanent.

PATENT LAW AMENDMENT ACT, 1852.—The members of the Society will be glad to learn that the Commissioners of Patents are taking steps for the formation of a Complete Index of Past Patents, available for consultation by the public. As a first step towards the attainment of this very desirable object, a Bill has been introduced into Parliament to enable the Commissioners to purchase certain Indexes of Specifications for 1,000*l.*, and to pay the purchase-money out of moneys arising from fees received on Patents. The Committee to whom the Bill has been referred have reported in favour of this provision. It is understood that the Indexes proposed to be purchased are very complete, and constructed on a principle offering very great facilities for consultation.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 10th Dec., 1852.

Dated 16th Nov., 1852.

767. J. Ramsbottom—Steam-engines.

Dated 24th Nov.

836. W. Oldham—Dibble-drill.
837. A. T. Forder—Fenders for railway carriages.
838. J. Carter—Articles of dress.
839. J. Higgin—Mordants.
840. J. Gedge—Incubator.
841. P. A. le Compté de Fontainemoreau—Machine for manufacturing fishing-nets.
842. A. Brackenbury—Electrifying-machine.
843. H. R. Caselli—Anchors.
844. R. Greenwood—Warming houses.
845. J. R. Cochrane—Figured Fabrics.
846. J. H. Combes—Preventing dampness in walls, &c.
847. H. Thomson—Apparatus for dyeing, &c.
848. C. Finlayson—Heating, drying, and ventilating.
849. A. J. L. H. T. Compté de Septeuil—Electro-magnetic engines and batteries.
850. W. H. Winchester—Splints.
851. W. Wilkinson—Looped and textile fabrics and machinery.
852. A. Joly—Steam-engines.
853. S. Spalding—Machine for pantiles.
854. E. Aitchison—Furnaces.
855. R. M. Glover—Coating ships' bottoms, &c.

Dated 25th Nov.

856. R. Dudgeon—Raising weights by portable hydraulic press.
858. J. Tatham and D. Cheetham—Machinery for doubling and spinning cotton, &c.
859. T. Bennett—Heating air for blast furnaces.
860. W. Hall—Rotary steam-engines and supplying boilers, &c.
861. J. Murdoch—Machine for shaping staves, &c. (A communication.)
862. A. Jeffrey—Reaping-machines.
863. H. Holland—Umbrellas and parasols.
864. M. F. J. Delafosse—Preserving wood, &c. (A communication.)
865. C. Harford—Rotatory engines.
866. J. Robertson—Furnaces and fireplaces.
867. C. Iles—Chimney-pieces.

Dated 26th Nov.

868. A. F. Remond—Improved lock.
869. A. Ogden and J. Ogden—Spinning cotton, &c.
870. J. W. Hoby and J. Kinniburgh—Metal castings.
871. J. Taylor—Docks for repairing and building ships.
872. A. E. L. Belford—Bricks.
873. C. C. Glover—Stopping bottles for aerated liquids.
874. P. Sornani—Travelling-case.
875. A. J. C. Hudault—Leaven.
877. T. A. Cook—Bleaching.
878. C. Medwin—Water-gauges.
879. J. A. Oudart—Presses for copying letters.
880. A. Turiff—Moulding metals.
881. H. B. Condy—Acetic acid.
882. A. F. Cossus—Lubricating apparatus.
883. W. Massingham—Carriages and apparatus for carrying the dead.

884. R. B. Feather—Ships, and in rendering them shot-proof.
885. G. A. Huddart—Tools for cutting and abrading surfaces.
886. E. L. Brundage—Drawing off fluids from animal bodies. (A communication.)
887. T. Wood—Motive power.
888. G. A. Huddart—Combustion in boiler furnaces.
889. G. A. Huddart—Artificial flies.
890. M. J. P. Moriceau—Sharpening and dressing cards and clippers of shearing-machines.

Dated 27th Nov.

893. J. Lotsky—Pestalozzian gymnastic playthings.
894. W. J. Curtis—Tram-roads and carriages.
895. E. Martin—Extracting gluten from wheat, and preparing the same.
896. J. Gilmore—Extinguishing fire in ships.
897. G. Houghton—College caps.
898. W. E. Schottlander—Boring for drains and sewers, laying pipes and manufacture of same, and instruments for levelling. (A communication.)

Dated 29th Nov.

899. F. Westbrook—Clasps for books.
900. S. C. Lister and J. Warburton—Manufacture of yarn, &c.
901. T. Dudgeon—Hydrostatic propulsion.
902. W. Fowler and W. M'Collin—Clod-crusher.
903. W. Pink—Stirrup-bar for saddles.
904. E. Nicolle—Damping, cutting, and attaching stamps and labels.
905. M. S. Kendrick—Grates and fireplaces.
906. M. S. Kendrick—Lamps and burners.
907. J. D. Schneider—Maps and charts.
908. F. W. Ellington—Screws for collapsible and other vessels.
909. W. Brown—Electric telegraph.

From Gazette, 14th Dec.

WEEKLY LIST OF PATENTS SEALED.

William Hodgson, of Heircoat, in the County of York, engineer, for improvements in the manufacture of woven, textile, and looped fabrics, and in the machinery employed therein.

This patent, being opposed at the Great Seal Patent-office, was not sealed until Dec. 15, but bears date Sept. 30th last, the day on which it would have borne date but for the opposition it received by order of the Lord Chancellor.

77. Stephen Soulbey, Ulverston, Lancaster.—Improvements in machinery for letter-press printing.
78. William Smith, Kettering, Northamptonshire.—Improvements in machinery or apparatus for cleaning currants, raisins, and other fruits and vegetable substances.
79. Henry Smith, Stamford, Lincolnshire.—Improvements in reaping-machines.
80. Matthias Walker, Horsham, Sussex.—Ash-pan, or apparatus for taking up cinders and ashes, and separating or sifting them.
150. Thomas Boyd, Glasgow, N.B.—Improvements in the treatment or finishing of woven fabrics.
193. Ralph Errington Ridley, Hexham, Northumberland.—Improvements in cutting and reaping-machines.
237. Herm. Jäger, Ludgate hill.—Improvements in the treatment of cotton, and other similar fabrics, by the introduction of chemical agents to supersede the use of dung in the dunging process.
290. William Horsfield, Swillington-mills, near Leeds.—Improvements in splitting, crushing, and grinding corn, seeds, grain, minerals, or other substances.
370. Robert Pinkney, 26, Long Acre.—Improvements in cases for holding marking materials.
380. Alfred Augustus de Reginald Hely, Cannon-row, Westminster.—Improved waiter, or tray.
407. Charles Henry Waring, Neath Abbey, Glamorgan.—Improvements in the cutting and working or quarrying of coal, stone, shale, clay, and other similar substances, and in machinery for that purpose.
409. Evan Leigh, Manchester.—Improvements in machinery or apparatus for carding cotton, and other fibrous materials.
423. Samuel Fletcher Cottam, Manchester.—Improvements in quarrying slate.
475. John Currie, Glasgow, N.B.—Improvements in grinding wheat and other substances, and in the treatment and preparation of such substances, and the products thereof.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
Dec. 9	3396	Mitcheson's Registered Anchor.	W. Mitcheson & Sons	18, Sise-lané, Queen-street.
" 10	3397	The Registered Hackle.	John Worrall	Bernard-lane, Sheffield.
" "	3398	A Spinner's Bobbin-nail.	Thomas Carr	Chowbent, near Manchester.
" 13	3399	Coat.	John Clent Boucher	Birmingham.
" 14	3400	Improved Venetian Ventilator.	Fred. Johnson and Wm. Farrar	16, Castle-street, Holborn.